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National Rural Telecommunications Cooperative**

**Statement to Rural Utilities Service  
Public Meeting on Rural Broadband Access  
Washington, DC June 27, 2002**

Good morning. My name is Mark Brown and I am here representing the National Rural Telecommunications Cooperative (NRTC), a not-for-profit cooperative organization of 1,109 rural electric cooperatives, rural telephone cooperatives, and independent rural telephone companies, located in 48 states.

Prior to joining the staff of NRTC, I was general manager of Northeast Oklahoma Electric Cooperative and its subsidiary, Northeast Rural Services. In that capacity, I have applied to RUS for loans and I have first-hand experience of this agency's essential function in the provision of electric, water, and telecommunications services to rural areas.

It's NRTC's strong belief that the future of broadband in rural America must include a role for satellite Internet technologies. Due to the vast distances and rugged terrain of rural America, there is simply no way to reach all of our citizens with advanced telecommunications services – now or in the foreseeable future – without satellites.

No single Internet technology will serve all of rural America. However, anyone in the continental United States with a clear view of the southern sky can receive satellite Internet services. Satellite Internet today provides high-speed service to rural residents in areas where there are no cable modem, digital subscriber line (DSL) or fixed wireless Internet providers.

We urge RUS to remember the strengths of satellite Internet technology as it develops the rules for Rural Broadband Access loans and loan guarantees. RUS's role in the expansion of broadband services will be considerable, including the role it could play in the expansion of satellite Internet services.

NRTC's goal since its founding in 1986 has been to provide affordable, high-quality telecommunications services to rural communities, and satellite services have been at the center of that effort from the beginning. NRTC, its members and affiliates currently market and distribute Hughes Network Systems' (HNS) DIRECTV service to more than 1,700,000 rural households. For the past year, our members also have been offering Ku-band satellite Internet services -- both the HNS DIRECWAY service and the service offered by StarBand Communications, Inc.

We are encouraged that the demand for high-speed Internet (HSI) has been trending upward. As other rural broadband and high-speed service providers operating with other technologies likely will tell you, the numbers of actual subscribers to these services have been modest in the beginning. A number of factors, however, have increased the rate of new HSI installations among our members.

An analysis of our past year's experience clearly indicates why we expect satellite Internet service to continue growing.

#### **'Always-on' Is the True Benefit of Broadband**

Too often, broadband technology analyses bog down in a comparison of the data rates the various broadband services have to offer. For example, some analysts use the FCC's definition of "advanced telecommunications capability" (infrastructure capable of

delivering a speed in excess of 200 kbps in each direction) as the benchmark for “broadband” service.

DIRECWAY and StarBand offer peak speeds of between 400 kbps and 500 kbps downstream. Their upstream operations, however, are slower than 200 kbps. Speed is important, but not the most important factor to consider when examining Internet technologies. DIRECWAY and StarBand, like other broadband services, are packet data networks and, therefore, are always on.

The ability to deliver a continuous stream of high-speed data opens up a world of new applications that have been unavailable or impractical in the dial-up Internet world.

- DIRECWAY and StarBand subscribers today enjoy the benefits of high-quality streaming audio and video Internet services.
- They can download large audio/video files, high-resolution photographs, thick research reports and other documents in seconds.
- Satellite Internet subscribers have the option of connecting several computers in their home to DIRECWAY or StarBand using various networking solutions.

Satellite Internet services support these applications just as well as cable modem or DSL because they do not depend on upstream data capability. They depend on the versatility and efficiency of the Internet protocol (IP) and packet data networking, without having to tie up a telephone line.

A session at an NRTC-sponsored conference earlier this year focused on how young adults entering the workforce today view the Internet. One of the panelists was a junior in college who described why she liked to use instant messaging (IM) technology. When she is in her room studying, she said, her computer (connected to an always-on

service) occasionally sounds the arrival of an IM note from her good friend ... in Australia.

With dial-up Internet service, her Australian friend would reach her only if she happened to be online. Otherwise, the only form of real-time communications available would be long-distance voice. That is a costly alternative for a college student.

It is also a costly alternative for a small-town business. Farms, ranches, as well as the growing number of "teleworkers" relocating to rural America, need access to always-on communications for business-level e-mail, IM, Web access, virtual private networks (VPN), and file transfer applications. As I will mention in more detail later, some NRTC HSI members recently began offering their business subscribers these applications through the new DIRECWAY Business Edition.

The next generation of American consumers, urban and rural, is coming to expect real-time, always-on Internet communications capability. That is the type of capability DIRECWAY and StarBand can offer today in areas where there are no cable modem or DSL connections. Many always-on applications, like IM and e-mail, operate smoothly, regardless of the upstream speed.

### **The Ka-band Future**

Improved speeds will come as the technology matures and additional spectrum capacity opens up. DIRECWAY and StarBand Internet services operate in the Ku band – the same segment of the electromagnetic spectrum where Direct Broadcast Satellite (DBS) providers currently transmit multichannel video services. There is limited

bandwidth available in the Ku band for Internet services that offer in excess of 200 kbps in both directions.

However, satellite Internet interests are preparing for the day in the near future when they will be able to offer much higher-speed services over Ka-band satellites. The FCC has awarded several companies with Ka-band orbital slots to provide broadband data services well in excess of 1 Mbps, both upstream and downstream. Different Ka-band ventures have different technologies and business plans. However, most of these plans project throughputs equal or superior to current cable modem or DSL services.

The current business climate, complicated by the proposed merger of HNS/DIRECTV with EchoStar Communications, has slowed some planned Ka-band satellite launches. However, the current uncertainties in the business world are temporary. Soon, perhaps as early as next year, companies will begin launching Ka-band services, leading to significant upgrades in satellite Internet technical capabilities.

Other broadband service providers are experiencing similar delays in the current business climate. It is conceivable that Ka-band services will reach some rural homes before many urban areas have access to equivalent terrestrial networks.

In the meantime, it is in the public interest to promote current generation Ku-band services – the forerunners of the future Ka-band systems.

Congress has directed the Secretary of Agriculture to set the minimum technical requirements needed to qualify for loans through the Rural Broadband Access program. We urge you to consider the value of always-on service before setting any arbitrary standards based on speed.

## **Satellite Internet Is Making an Immediate Impact**

As I mentioned before, anyone in the continental United States with a clear view of the southern sky can receive satellite HSI services. StarBand also covers Alaska and Hawaii. By the end of this summer, HNS plans to begin commissioning new DIRECWAY subscribers using transponders on the Galaxy IVR satellite, which has a footprint covering Hawaii and parts of Alaska. These services are reaching rural households that cable modem and DSL may never reach. Some rural communities already are feeling the benefit of always-on Internet capability.

For example, West Florida Electric Cooperative, an NRTC HSI participant located on Florida's Panhandle, has distributed DIRECWAY to rural private schools nationwide. Upon finishing NRTC's HSI installation training in Summer 2001, West Florida's manager of Internet services met with an independent contractor that needed an immediate distance learning solution to serve a religious organization's rural schools located throughout the United States. West Florida had everything the contractor needed to complete the job – available satellite Internet equipment, the ability to consolidate the bill for Internet service in multiple locations, and the ability to train DIRECWAY installers quickly.

Another NRTC member, 3 Rivers Telecommunications ("3 Rivers") in Fairfield, Montana, has built a crew of 40 trained technicians to travel throughout the state for satellite Internet installations. Soon after 3 Rivers began installing service a year ago, it detected a great deal of interest in the service, not only among residential users. Gas stations, truck stops, hotels and several other businesses throughout the state signed up for DIRECWAY because they had no other access to high-speed, always-on services. 3

Rivers found that rural businesses needed high-speed service, even if it was a 400 kbps downstream service designed for residential users.

Recognizing that demand for business applications, NRTC recently began offering the DIRECWAY Business Edition – an upgraded version of the residential Internet service for small office/home office (SOHO) subscribers. For somewhat higher monthly rates, HNS will offer business clients Internet access up to 1 Mbps downstream speeds. (Upstream speeds remain at the residential sub-200 kbps rate.)

The Business Edition package comes with a free static IP address, which enables rural businesses to install sophisticated e-mail and VPN applications equivalent to those in downtown office networks. Businesses have the option of ordering office networking capability for up to 20 individuals to access the satellite Internet service on the same office account. NRTC also offers features such as branded e-mail (e.g., [jdoe@yourcompany.com](mailto:jdoe@yourcompany.com)), SPAM/virus filtering, and 25 megabytes of capacity for Web hosting.

NRTC's members are introducing business-level satellite Internet service to farmers and ranchers and other agriculture-related businesses; to hotels, resorts, parks and other businesses related to the tourist industry, and to small-town retailers. High-speed Internet services are important tools that businesses in all areas need in order to compete. Satellite Internet will help maintain the economic viability of communities where landline Internet networks are unavailable.

For more background on the types of residential and SOHO broadband services available to rural Americans, we recommend reading "Broadband for Rural America

2002 Status Report,” an independent study that NRTC commissioned in cooperation with the National Rural Electric Cooperative Association.

### **Satellite Internet in the Public Interest**

A small-town community relies on its public services as well as its businesses. Schools, local governments, police and other emergency services, and healthcare providers require advanced telecommunications capability.

Recognizing public interest benefits that broadband Internet extends to all Americans, President Bush declared in a June 13 speech at the White House: “This country must be aggressive about the expansion of broadband.”

The President also noted the importance of improving high-speed data service to remote areas, not just to his Crawford, Texas, ranch – where Mr. Bush said he would like to see faster Web service – but to the nation’s rural schools. “We have virtual classrooms in Texas, virtual school districts in Texas, where we’ve hooked up a fairly wealthy school district with rural or poor school districts,” the President said, referring to his years as Texas governor. “It made a huge difference. It would have been a heck of a lot better if there had been broadband technology, however, to make the process move a lot quicker.”

We think there are several services to rural Americans that would be a heck of lot better if there were broadband networks to support them. Broadband services could and would make a real difference in people’s lives.

Next week, HNS plans to conduct a dramatic demonstration of DIRECWAY in a “telehealth” application. On July 1, doctors at the Columbia Eye Clinic in Columbia, SC, will conduct remote examinations of patients at the Comprehensive Health Care Center



located in a rural area some miles outside the town of Ridgeland, SC (population 2,518). The U.S. Department of Health and Human Services, Office for the Advancement of Telehealth, is providing some of the funding for this service.

Retinopathy screening is a procedure eye doctors perform to determine the risk of eye damage to patients suffering from diabetes and hypertension. Remote examinations allow rural patients, many of them elderly patients, to prevent the onset of blindness through the early detection of retinal injuries. Often, the rural patient's only alternative is to travel hundreds of miles to the nearest eye-care center.

High-speed, always-on Internet networks easily support services like retinopathy screening. In rural areas where there is no cable modem or DSL services, satellite Internet may be the only way that rural patients benefit from new remote medical diagnosis procedures.

### **Satellite Internet Works Well in Combination With Other Technologies**

We have been observing the progress of terrestrial wireline and wireless technologies closely. NRTC is excited by the advancements many of those technologies have made to serve rural communities.

For example, some NRTC-member telephone service providers offer remote DSL services by setting fiber optic or T1 links from their central offices to digital loop carriers installed at remote nodes. Other NRTC members have deployed "Ethernet in the First Mile," a technology that allows telcos to provide copper-based Internet services at higher speeds and longer distances than standard asymmetrical DSL – up to 24,000 feet from the central office compared to 18,000 feet – at lower cost.

NRTC recently has begun offering its members equipment to deploy affordable fixed wireless Internet access based on the IEEE 802.11b standard. Unlicensed wireless technologies such as 802.11b, which can cover an entire small town and miles into the countryside by transmitting from a few low-cost wireless nodes, have become a key part of many rural telecommunications providers' deployment strategies.

And yet, I will repeat: you cannot provide broadband service to all Americans without adding satellite to the equation.

NRTC member Diode Communications offers telephone, cable TV, satellite TV, and Internet service to subscribers in southeast Nebraska and northeast Kansas. Over the past year, Diode also has been offering fixed wireless broadband Internet service over the 2.4 GHz unlicensed band. Diode currently operates with nine transmit towers and plans to add more, with the capability to transmit two-way data services within about six to eight miles in all directions from each tower. Diode is offering a variety of high-speed services ranging from 128 kbps residential service for \$40 a month to 1 Mbps business service for \$110 a month.

As far and wide as the fixed wireless service transmits, Diode only reaches about 70 percent of the areas it serves. In the remaining 30 percent of its service area, Diode has installed dozens of DIRECWAY dishes, including several branch offices of the University of Nebraska's agricultural extension service.

Wireline and terrestrial wireless technologies cannot cost-effectively reach all points of the map. In a June 2000 study, the National Exchange Carrier Association (NECA) estimated it would cost \$10.9 billion to upgrade 3.3 million rural telephone lines to support DSL operations. In the most extreme cases, NECA estimated it would cost

\$9,328 per access line to reach remote rural households. Satellite Internet services cost significantly less than \$1,000 for equipment and initial installation, everywhere in the continental United States.

A year after its initial DSL cost report, NECA released a second study of rural "middle-mile" expenses – the cost of fiber optic transport from a rural broadband Internet service provider to the nearest Internet access node. NECA found that 55 percent of rural telephone companies with ISP facilities must transport high-speed Internet data at least 70 miles to the nearest node and that 10 percent are more than 200 miles away. The rural Internet provider's cost per line can range from \$17 to \$8,754 a month, depending on the distance and volume of Internet traffic, NECA said.

Middle-mile costs are an issue for DSL providers, as well as cable modem and fixed wireless Internet providers. Only direct-to-home satellite Internet providers avoid the middle mile. Monthly subscriber service charges tend to be \$60 to \$70 a month and the service provider does not experience transport costs.

Cable modem services have the extra expense of fiber optic deployment in part of the last mile to support broadband Internet and multichannel video services over hybrid fiber coax networks. Cable providers typically deploy them in the most densely populated services areas first. About 66 percent of U.S. households had access to cable modem service at the end of 2001, according to a Yankee Group study. The remaining unserved 34 percent cover rural areas, as well as some metropolitan areas.

Several NRTC members have followed the same path as Diode by deploying one form of broadband Internet service to cover towns and small cities and satellite HSI to fill in areas where other broadband technologies do not make economic sense. We fully

support this strategy, which ensures that all rural residents have option to purchase equivalent Internet access.

### **We are learning much in the Ku-band business**

NRTC members are learning more all the time about how to operate successful satellite Internet businesses. Our HSI participants entered into this business as pioneers. Although the technology and business operations are similar to the DBS business, satellite Internet services involve some additional the details and complexity.

Over the past year, NRTC has trained DIRECWAY and StarBand installers for more than 125 member cooperatives and commercial telephone companies. Much has changed in that time. A year ago, a typical satellite Internet installation at a rural residence was an all-day project. Sometimes, an installer would have to return for part of a second day.

Many NRTC members have cut their installation times to three or four hours. Installers have learned new techniques and found tools that help them cut down on the time needed to install the satellite dish, especially in cases where a customer orders both data and TV service. Some members have experimented with two-person installation teams -- one working on the roof and one working on the computer in the consumers' home -- which results in a significant net reduction in total man-hour installation times. DIRECWAY and StarBand also have instituted software enhancements to improve communications between installers in the field and their central network operations centers.

On the marketing side, HSI providers also have explored creative ways to build demand for satellite Internet service. For example, West Florida Electric, the same cooperative I mentioned before that has been providing Internet access to schools around the country, recently sought to boost sales in its local region. So they sponsored a Memorial Day Beach Boys concert in nearby Panama City, FL.

West Florida's theory was that surfing and the Internet go together. What better way to call attention to the service than to provide music from the all-time masters of surf music? In tandem with the concert, West Florida began a summer-long radio campaign including 30-second and 60-second spots; sponsored a live remote radio rally two days before the concert; made DIRECWAY promotional announcements from the stage during the concert, and held a contest to give one lucky winner free DIRECWAY service for a year.

The result was a long list of new DIRECWAY service orders from the rural resort areas where West Florida was focusing its campaign.

As I mentioned in the beginning, we are noticing a significant increase in the number of satellite Internet installations among our members. One of the key reasons for this growth, I believe, is that HSI providers have found ways to reduce the initial cost of satellite Internet service. NRTC's members are free to set their own equipment and service prices. But unless HSI providers offer an extremely generous discount, the subscriber's equipment cost is several hundred dollars.

Many HSI providers have instituted programs to spread out the cost of equipment. In one offer, for example, the customer pays \$99 upfront for equipment and installation. The customer then pays \$99 for each of the following 12 months for the service and the

remaining cost of the equipment. After the first year, the customer has the option of dropping the service or staying with the service at a reduced monthly charge of \$59 for service.

Some HSI providers also are considering equipment-leasing options. Rather than selling the subscriber the equipment, the provider would retain ownership and bill a small monthly rental. If the subscriber decided to drop service, the HSI provider could reuse the equipment. Also, leasing options provide the HSI provider with a new set of flexible incentive pricing options to attract new subscribers.

How far might RUS loans to finance creative equipment leasing programs go toward making satellite Internet affordable to more rural Americans? It is a question I would love to explore in the coming months.

## **Conclusion**

The Telecommunications Act of 1996, Section 706, announces the federal government's clear goal: to make advanced telecommunications services available to all Americans in a reasonable and timely fashion. I deeply believe that satellite Internet qualifies as an "advanced service." Furthermore, satellite Internet is a necessity if the goal is to reach all Americans. We ask that DIRECWAY and StarBand service providers be eligible for loans and loan guarantees under the Rural Broadband Access program.

There have been a lot of fun moments over the past year of rolling out satellite HSI to rural America. It is an always-changing business due to the constant advancement of technology and the imaginations of rural entrepreneurs. For those same reasons, I confidently predict that satellite Internet technology and applications can only get better.